

## SPHERES/Universal ISS Battery Charging Station, Phase II

Completed Technology Project (2012 - 2015)



## Project Introduction

With the retiring of the shuttle fleet, up-mass and down-mass to ISS are at a premium. The space station itself has a limited lifecycle as well, thus long-term and/or high-risk development programs pose issues for science 'return on investment', if the technology cannot be adequately matured before the station is decommissioned. Thus innovative systems and technologies that minimize impact on limiting resources such as up-mass, down-mass and crew time, and can do so in the near- to mid-term, are highly desirable. One such area includes the various rechargeable battery systems on ISS used extensively for cameras, camcorders, laptops, communication systems and other portable science and diagnostic equipment. A common (universal) battery charging system for ISS, with the flexibility to accommodate current and future rechargeable battery requirements for payloads and equipment, could reduce the cost of use of the ISS for payload developers. Such a system would not only simplify the safety and integration process for battery-operated ISS applications, but also reduce up-mass by making use of existing ISS resources. In its SBIR Phase I program, Aurora Flight Sciences laid the groundwork for such a system, based on the needs of current and planned ISS battery system requirements. The results of the study indicate that a universal rechargeable battery system is feasible and could significantly reduce up-mass and crew-time to support current and future ISS programs. Expanding on the feasibility study performed in Phase I, Aurora will deliver a protoflight charger system and supporting documentation at the conclusion of Phase II. The proposed system will be fully developed in compliance with NASA safety and integration criteria within the 2-year SBIR Phase II timeframe, facilitating procurement of flight and ground support hardware by NASA in a potential Phase III program.



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## Organizational Responsibility

### Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

### Responsible Program:

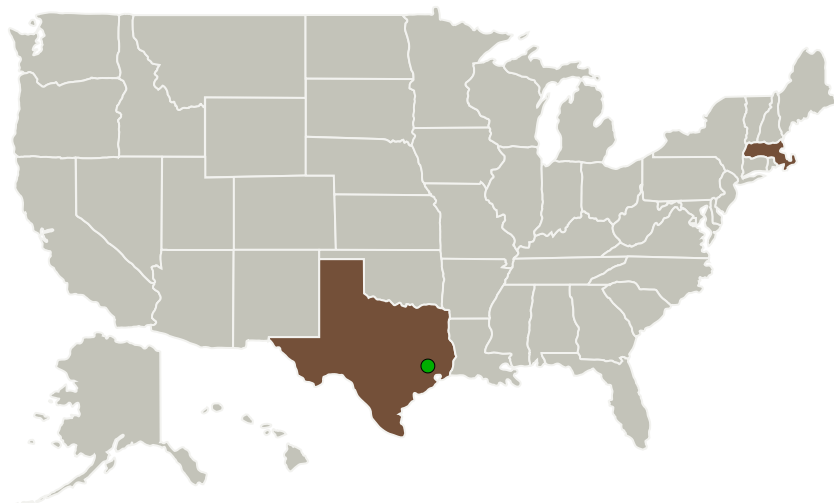
Small Business Innovation Research/Small Business Tech Transfer

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## Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
● Johnson Space Center(JSC)	Supporting Organization	NASA Center	Houston, Texas

Primary U.S. Work Locations	
Massachusetts	Texas

## Project Management

**Program Director:**

Jason L Kessler

**Program Manager:**

Carlos Torrez

**Principal Investigator:**

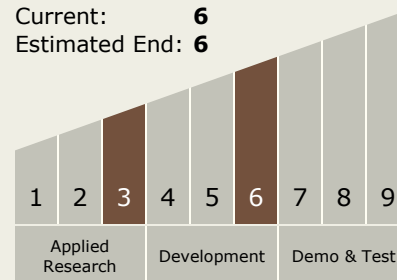
John F Merk

**Co-Investigator:**

John Merk

## Technology Maturity (TRL)

Start: 3  
 Current: 6  
 Estimated End: 6



## Technology Areas

**Primary:**

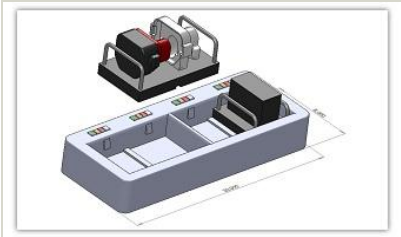
- TX07 Exploration Destination Systems
  - └ TX07.2 Mission Infrastructure, Sustainability, and Supportability
    - └ TX07.2.2 In-Situ Manufacturing, Maintenance, and Repair

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### Images



### Briefing Chart

SPHERES/Universal ISS Battery  
Charging Station, Phase II  
(<https://techport.nasa.gov/image/135993>)

### Target Destinations

The Sun, Earth, The Moon,  
Mars, Others Inside the Solar  
System, Outside the Solar  
System